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Subpart H - Cement Production

 A printer-friendly version (pdf) (25 pp, 7,181K) of GHG reporting instructions for this subpart

Please select a help topic from the list below:

- Using e-GGRT to Prepare Your Subpart H Report
 - Subpart H Summary Information for this Facility
 - Subpart H Kiln Information for Kilns NOT Monitored by CEMS
 - Subpart H Kiln Information for Kilns Monitored by CEMS
 - Subpart H Emissions Information for Kilns NOT Monitored by CEMS
 - Subpart H Emissions Information for Kilns Monitored by CEMS
- Using Subpart H Calculation Spreadsheets
- Carry forward of data from previous submissions into RY2011 forms
- Subpart H Rule Guidance
- Subpart H Rule Language (eCFR)

Additional Resources:

- Part 98 Terms and Definitions
- Frequently Asked Questions (FAQs)
- Webinar Slides

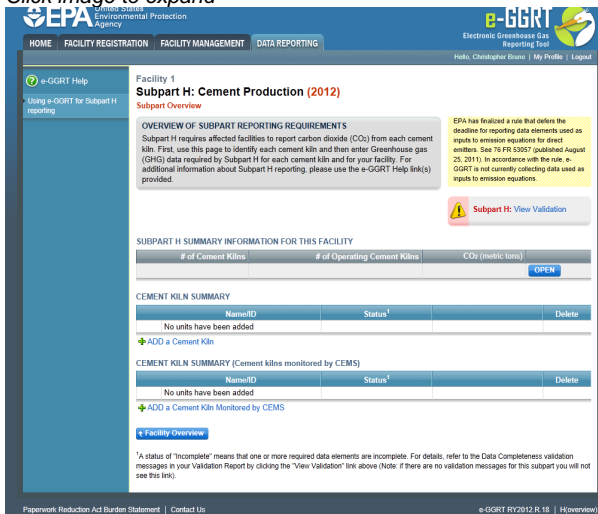
Using e-GGRT to Prepare Your Subpart H Report

This page provides an overview of subtopics that are central to Subpart H reporting. This information is entered from the e-GGRT Subpart H Overview web form shown below. Each topic represents a key web form(s) you where you need to enter information:

- Subpart H Summary Information for this Facility
- Subpart H Kiln Information
- Subpart H Emissions Information
- Subpart H Validation Report

If you previously reported for Reporting Year (RY) 2011, the Agency has carried some of your RY2011 data forward and entered it in your RY2012 forms to reduce reporting burden. It is still your responsibility to review and assure that all the information in your submission is correct, but the Agency believes that most of the data which is carried forward is unlikely to change significantly from year to year. For more information about carry forward data, please see the [Carry forward of data from previous submissions into RY2012 forms help content](#).

Click image to expand



The screenshot displays the EPA e-GGRT web interface for Subpart H: Cement Production (2012). The interface includes a navigation menu with options like HOME, FACILITY REGISTRATION, FACILITY MANAGEMENT, and DATA REPORTING. The main content area is titled "Subpart H: Cement Production (2012)" and contains an "OVERVIEW OF SUBPART REPORTING REQUIREMENTS" section. This section explains that Subpart H requires reporting carbon dioxide (CO₂) from each cement kiln and provides instructions on how to use the e-GGRT help link(s) for additional information. A yellow warning box on the right side of the overview section states: "EPA has finalized a rule that defers the deadline for reporting data elements used as inputs to emission equations for direct emitters. See 76 FR 53057 (published August 23, 2011). In accordance with the rule, e-GGRT is not currently collecting data used as inputs to emission equations." Below the overview, there are two summary tables: "SUBPART H SUMMARY INFORMATION FOR THIS FACILITY" and "CEMENT KILN SUMMARY". The first table shows columns for "# of Cement Kilns", "# of Operating Cement Kilns", and "CO₂ (metric tons)", with an "OPEN" button. The second table, "CEMENT KILN SUMMARY", has columns for "Name/ID", "Status", and "Delete", and indicates that no units have been added. There are also links to "ADD a Cement Kiln" and "ADD a Cement Kiln Monitored by CEMS". At the bottom, there is a "Facility Overview" link and a note about the status of "incomplete" data elements.

The end of the page provides links you can use for more detailed information and instructions on entering required information related to each of these topics.

Subpart H Summary Information for this Facility

Subpart H requires you to report the following data about your facility:

- Annual CO₂ process emissions from cement manufacturing (metric tons)
- Annual cement production for the facility (short tons)
- The total number of kilns at the facility
- The total number of operating kilns

Subpart H Kiln Information

The required kiln information and the forms associated with required kiln information are entered into e-GGRT are different for kilns that are monitored by a Continuous Emissions Monitoring System (CEMS) and kilns that are NOT monitored by a CEMS.

As a result, separate help content has been created in this subpart for entering kiln information for kilns monitored by CEMS and kilns NOT monitored by CEMS.

For each kiln that is NOT monitored by CEMS at your facility, the following kiln information is required:

- An indication of whether annual CO₂ emissions from raw materials will be estimated based on consumption of individual raw materials or based on the amount of raw kiln feed consumed annually
- A unique identifier and optional description
- A unique identifier/description for each raw material consumed in the kiln during the reporting year (applies only if the estimate of annual CO₂ emissions from raw materials is based on consumption of individual raw materials)

For each kiln that is monitored by CEMS at your facility, the following kiln information is required:

- A unique identifier and optional description

Subpart H Emissions Information

Subpart H Cement Production does NOT require you to report CO₂ process emissions for each kiln NOT monitored by CEMS.

CO₂ process emissions for all kilns should be reported in the SUBPART H SUMMARY INFORMATION FOR THIS FACILITY table on the Subpart Overview page.

For each CEMS Monitoring Location, provide the following information:

- A unique unit name or identifier for the CML (see also [About Unique Unit Names](#))
- An optional description or label for the CML
- The configuration of processes or process units that are monitored by the CML:
 - Single industrial process or process unit that exhausts to a dedicated stack
 - Multiple industrial processes or process units share a common stack
 - Industrial process or process unit shares a common stack with one or more stationary fuel combustion units
- The name of each fuel combusted in the unit(s) monitored by the CEMS
- The Tier 4/CEMS methodology start and end dates
- The cumulative total of hourly CO₂ mass emissions for each quarter of the reporting year (in metric tons) (*Do not cumulate emissions data between quarters*)
- The total annual CO₂ mass emissions measured by the CEMS (in metric tons)
- An indication whether emissions reported for the CEMS include emissions calculated according to 98.33(a)(4)(viii) for a slipstream that bypassed the CEMS
- The total annual biogenic CO₂ emissions from the combustion of all biomass fuels combined (in metric tons) (*if applicable*)
- The total annual non-biogenic CO₂ emissions (includes fossil fuel, sorbent, and process CO₂ emissions, in metric tons)
- The total annual CH₄ and N₂O emissions associated with the combustion of all [Table C-2](#) fuels combusted in all processes/process units monitored by the CEMS derived from application of [Equation C-10](#) (in metric tons) (*if there are no combustion emissions in this CML, please enter zero*)
- The total number of source operating hours in the reporting year
- The total operating hours in which a substitute data value was used in the emissions calculations for the CO₂ concentration parameter
- The total operating hours in which a substitute data value was used in the emissions calculations for the stack gas flow rate parameter
- If moisture correction is required and a continuous moisture monitor is used, the total operating hours in which a substitute data value was used in the emissions calculations for the stack gas moisture content parameter
- The name/identifier of the process units monitored by the CML

Subpart H Validation Report

You can use the Validation Report to assist with the completeness and quality of your reporting data.

You should use the Validation Report to check your work. The Validation Report performs two types of checks:

- Data Completeness: Data required for reporting that are missing or incomplete.
- Data Quality: Data that are outside of the expected range of values.

You may view the Validation Report at any time.



Note that the Validation Report is intended to assist users in entering data, but it is not an indication that the reporter has entered all necessary information, nor is it an indication that the reporter is in compliance with part 98. Furthermore a negative finding on the validation report is not a guarantee that a data element was entered incorrectly.

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See Also

[Screen Errors](#)

[Subpart H Summary Information for this Facility](#)

[Subpart H Kiln Information for Kilns NOT Monitored by CEMS](#)

[Subpart H Kiln Information for Kilns Monitored by CEMS](#)

[Subpart H Emissions Information for Kilns NOT Monitored by CEMS](#)

[Subpart H Emissions Information for Kilns Monitored by CEMS](#)

[Subpart Validation Report](#)

Subpart H Summary Information for this Facility

This page provides a description of how to enter Subpart H Cement Production summary information for this facility.

Adding or Updating Summary Information for this Facility

To add or update summary information for this facility, locate the SUBPART H SUMMARY INFORMATION FOR THIS FACILITY table on the Subpart Overview page and click OPEN.

Click image to expand

The screenshot displays the EPA e-GGRT interface for Subpart H reporting. The top navigation bar includes 'HOME', 'FACILITY REGISTRATION', 'FACILITY MANAGEMENT', and 'DATA REPORTING'. The main content area is titled 'Facility 1 Subpart H: Cement Production (2012)'. It features an 'OVERVIEW OF SUBPART REPORTING REQUIREMENTS' section, a 'SUBPART H SUMMARY INFORMATION FOR THIS FACILITY' table with an 'OPEN' button, and two 'CEMENT KILN SUMMARY' tables. The first table is for kilns not monitored by CEMS, and the second is for kilns monitored by CEMS. Both tables show 'No units have been added' and an 'ADD' button. A 'View Validation' button is also visible.

Subpart H requires you to report the following data about your facility:

- Annual CO₂ process emissions from cement manufacturing (metric tons)
- Annual cement production for the facility (tons)
- The total number of kilns at the facility
- The total number of operating kilns

For assistance in calculating CO₂ process emissions from cement production, access the calculation spreadsheets for this subpart by clicking the link located below the red emissions data entry box titled "Use Subpart H equation spreadsheets to calculate," then follow the provided instructions.

When you have entered the required information, click SAVE. You will then be directed back to the Subpart Overview page to complete entering

any other required data.

Click image to expand

Facility 1
Subpart H: Cement Production (2012)
Subpart Overview • Subpart H Summary Information

SUBPART H SUMMARY INFORMATION FOR THIS FACILITY
Subpart H requires a facility to report the facility information described below. For additional information about the facility information required by Subpart H, please use the e-GGRT Help link(s) provided.

EQUATION H-1 SUMMARY AND RESULT

$$CO_{2CEM} = \sum_{m=1}^k CO_{2CEM,m} + CO_{2CEM}$$

Hover over an element in the equation above to reveal a definition of that element.

Annual CO₂ process emissions from cement manufacturing (metric tons)

Annual cement production for the facility (tons)

TOTAL NUMBER OF KILNS

Number of kilns

Number of operating kilns

CANCEL SAVE

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See Also

[Screen Errors](#)

[Using e-GGRT to Prepare Your Subpart H Report](#)

[Subpart H Kiln Information for Kilns NOT Monitored by CEMS](#)

[Subpart H Kiln Information for Kilns Monitored by CEMS](#)

[Subpart H Emissions Information for Kilns NOT Monitored by CEMS](#)

[Subpart H Emissions Information for Kilns Monitored by CEMS](#)

[Subpart Validation Report](#)

Subpart H Kiln Information for Kilns NOT Monitored by CEMS

This page provides step-by-step instructions on how to enter and edit Subpart H Cement Production kiln information for Kilns NOT monitored by CEMS.

Step 1: Add a kiln

To add a kiln that is NOT monitored by a CEMS, find the CEMENT KILN SUMMARY table on the Subpart Overview page and click the link titled "ADD a Cement Kiln."

To edit kiln identification information, click the edit icon or the Name/ID link located in the first column of the table.

To delete a kiln, click the delete icon or red "x" located in the last column of the table.

Click image to expand

Step 2: Indicate CEMS utilization for a kiln

For each kiln that is NOT monitored by CEMS at your facility, confirm whether or not the kiln utilizes CEMS.



Note that when adding a new kiln you are prompted to answer the CEMS question immediately (the answer to this question will default to “No” for kiln added using the “ADD a Cement Kiln” link and will default to “Yes” for units added using the “ADD a Cement Kiln Monitored by CEMS” link).

The CEMS response may be changed here and the kiln information will be relocated to the appropriate table on the Subpart Overview page.

When finished, click SAVE.

Click image to expand

Step 3: Indicate method for estimating annual CO₂ for a kiln

For each kiln that is NOT monitored by CEMS at your facility, indicate if annual CO₂ emissions from raw materials will be estimated based on consumption of individual raw materials or based on the amount of raw kiln feed consumed annually.

When finished, click SAVE.

Click image to expand

Step 4: Enter required information for a kiln

For each kiln that is NOT monitored by CEMS at your facility, Subpart H requires you to report the following information:

- A unique identifier and optional description

For each kiln that annual CO₂ emissions from raw materials are based on consumption of individual raw materials, you must also provide a unique identifier/description for each raw material consumed in the kiln during the reporting year.

Click image to expand

The screenshot shows the EPA e-GGRT web application interface. The main content area is titled "Subpart H: Cement Production" for "Facility ABC (2010)". It contains several sections: "CEMENT KILN INFORMATION" with a subpart H requirement note; "UNIT INFORMATION" with a text input for "Name or ID" (containing "Kiln A1") and a "Description (optional)" field; "RAW MATERIAL" with a table containing one row for "Limestone"; "CONTINUOUS EMISSIONS MONITORING" with radio buttons for "Yes" and "No"; and "METHOD FOR ESTIMATING ANNUAL CO2" with radio buttons for "based on consumption of individual raw materials" and "based on the amount of raw kiln feed consumed annually". Navigation buttons include "Back to Overview" and "SAVE".

To add a raw material consumed in a kiln, click "Add A Raw Material" and enter the required information.

When finished, click SAVE to save the raw material and return to the Add/Edit a Cement Kiln page.

Click image to expand

This screenshot shows the same "Subpart H: Cement Production" form, but with the "RAW MATERIAL INFORMATION" section expanded. It shows a table with one row for "Limestone". The "RAW MATERIAL" section title is visible. The "CANCEL" and "SAVE" buttons are at the bottom of the form.

Step 5: Save entered kiln data

When you have finished entering data for a kiln, click SAVE to save all entered data then click BACK TO OVERVIEW to return to the Subpart Overview page.

Click image to expand

Step 6: Enter additional required annual, quarterly, and monthly information for a kiln

To enter additional required annual, quarterly, and monthly information for a kiln that is NOT monitored by a CEMS, locate the kiln in the CEMENT KILN SUMMARY table on the Subpart Overview page and click OPEN.

Click image to expand

Step 6a: Additional Required Annual Information

Depending on the method selected for determining annual CO₂ emissions from raw materials you will be asked to provide more information. For each kiln for which the facility indicated that annual CO₂ emissions from raw materials are to be based on raw kiln feed, reporters will be asked to enter the following required information:

- The number of months a missing data procedure was used to determine a monthly quantity of raw kiln feed consumption used in the determination of the annual consumption quantity. You must enter a value in this field. If missing data procedures were not applied enter '0'.
- The number of times a missing data procedure was used to determine the organic carbon content of the raw kiln feed. You must enter a value in this field. If missing data procedures were not applied enter '0'.

Click image to expand

Alternatively, for each kiln for which the facility indicated that annual CO₂ emissions from raw materials are to be based on consumption of individual raw materials, and for each raw material, enter the following required information:

- The number of months a missing data procedure was used to determine a monthly quantity of the raw material consumed used in the determination of the annual consumption quantity. You must enter a value in this field. If missing data procedures were not applied enter '0'.
- The number of times a missing data procedure was used to determine the organic carbon content of the raw material. You must enter a value in this field. If missing data procedures were not applied enter '0'.

Click image to expand

When finished, click QUARTERLY INFO.

Step 6b: Additional Required Quarterly Information

For each quarter and for each kiln, enter the following required information:

- An indication if a missing data procedure was used to determine the quantity of cement kiln dust (CKD) not recycled to the kiln [98.86(b)(14)(iv)]
- An indication if a missing data procedure was used to determine the fraction of non-calcined CaO in CKD not recycled to the kiln [98.86(b)(14)(v)]
- The method used to determine the fraction of non-calcined CaO in CKD not recycled to the kiln [98.86(b)(9)]
- An indication if a missing data procedure was used to determine the fraction of non-calcined MgO in CKD not recycled to the kiln [98.86(b)(14)(v)]
- The method used to determine the fraction of non-calcined MgO in CKD not recycled to the kiln [98.86(b)(9)]

Click image to expand

When finished, click MONTHLY INFO.

Step 6c: Additional Required Monthly Information

- An indication if monthly kiln-specific clinker factors were used to determine monthly clinker production [98.86(b)(15)]
- The method used to determine the monthly clinker production [98.86(b)(15)]. A drop-down menu is provided reflecting provisions in 98.3 and 98.84(d).
- The method used to determine the fraction of non-calcined CaO in clinker [98.86(b)(7)]. See 98.84(g) for more information on applicable methods.
- The method used to determine the fraction of non-calcined MgO in clinker [98.86(b)(7)]. See 98.84(g) for more information on applicable methods.
- An indication if a missing data procedure was used to determine the monthly clinker production [98.86(b)(14)(i)]
- An indication if a missing data procedure was used to determine the fraction of total CaO in clinker [98.86(b)(14)(ii)]
- An indication if a missing data procedure was used to determine the fraction of total MgO in clinker [98.86(b)(14)(ii)]
- An indication if a missing data procedure was used to determine the fraction of non-calcined CaO in clinker [98.86(b)(14)(iii)]
- An indication if a missing data procedure was used to determine the fraction of non-calcined MgO in clinker [98.86(b)(14)(iii)]

Click image to expand

When finished, click FINISHED to save your data and return to the Subpart Overview page.

Step 7: Repeat Steps 1-6

Repeat Steps 1-6 until all kilns that are NOT monitored by CEMS have been added for your facility, then proceed to [Subpart H Emissions Information for Kilns NOT Monitored by CEMS](#).

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See Also

- [Screen Errors](#)
- [Using e-GGRT to Prepare Your Subpart H Report](#)
- [Subpart H Summary Information for this Facility](#)
- [Subpart H Kiln Information for Kilns Monitored by CEMS](#)
- [Subpart H Emissions Information for Kilns NOT Monitored by CEMS](#)
- [Subpart H Emissions Information for Kilns Monitored by CEMS](#)
- [Subpart Validation Report](#)

Subpart H Kiln Information for Kilns Monitored by CEMS

This page provides step-by-step instructions on how to enter and edit Subpart H Cement Production kiln information for kilns that are monitored by CEMS.

Step 1: Add a kiln

To add a kiln that is monitored by CEMS, find the CEMENT KILN SUMMARY (Cement Kilns Monitored by CEMS) table on the Subpart Overview page and click the link titled "ADD a Cement Kiln Monitored by CEMS."

To edit identification information for a kiln, click the edit icon or the Name/ID link located in the first column of the table.

To delete a kiln, click the delete icon or the red "X" icon located in the last column of the table.

Click image to expand

Step 2: Indicate CEMS utilization for a kiln

For each kiln that is monitored by CEMS at your facility, confirm whether or not the kiln utilizes CEMS.



Note that when adding a new kiln you are prompted to answer the CEMS question immediately (the answer to this question will default to “No” for kiln added using the “ADD a Cement Kiln” link and will default to “Yes” for units added using the “ADD a Cement Kiln Monitored by CEMS” link).

The CEMS response may be changed here and the kiln information will be relocated to the appropriate table on the Subpart Overview page.

Click image to expand

When finished, click SAVE to save your data, then click BACK TO OVERVIEW to return to the Subpart Overview page.

Step 3: Enter required information for a kiln

For each kiln that is monitored by CEMS at your facility, Subpart H requires you to report a unique identifier and optional description

Click image to expand

When finished, click SAVE to save your data then click BACK TO OVERVIEW to return to the Subpart Overview page.

Step 4: Enter additional required monthly information for a kiln

To enter additional required information for a kiln that is monitored by a CEMS, locate the kiln in the CEMENT KILN SUMMARY (Cement kilns monitored by CEMS) table on the Subpart Overview page and click OPEN.

Click image to expand

The screenshot displays the EPA e-GGRT interface for Subpart H: Cement Production (2011). The page includes a navigation bar with 'HOME', 'FACILITY REGISTRATION', 'FACILITY MANAGEMENT', and 'DATA REPORTING'. A sidebar on the left contains 'e-GGRT Help' and 'Using e-GGRT for Subpart H reporting'. The main content area features an 'OVERVIEW OF SUBPART REPORTING REQUIREMENTS' section, a 'SUBPART H SUMMARY INFORMATION FOR THIS FACILITY' table, and two 'CEMENT KILN SUMMARY' tables. The first table is for kilns not monitored by CEMS, and the second is for kilns monitored by CEMS. Both tables currently show 'No units have been added'. A 'Facility Overview' link is also visible.

For each month and for each kiln, enter the following required information:

- An indication if a missing data procedure was used to determine the monthly clinker production
- Clinker production in short tons

Click image to expand

When finished, click FINISHED.

Step 5: Repeat Steps 1-4

Repeat Steps 1-4 until all kilns that are monitored by CEMS have been added for your facility, then proceed to Subpart H Emissions Information for Kilns Monitored by CEMS.

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See Also

- [Screen Errors](#)
- [Using e-GGRT to Prepare Your Subpart H Report](#)
- [Subpart H Summary Information for this Facility](#)
- [Subpart H Kiln Information for Kilns NOT Monitored by CEMS](#)
- [Subpart H Emissions Information for Kilns NOT Monitored by CEMS](#)
- [Subpart H Emissions Information for Kilns Monitored by CEMS](#)
- [Subpart Validation Report](#)

Subpart H Emissions Information for Kilns NOT Monitored by CEMS

Subpart H Cement Production does not require you to report CO₂ process emissions for each kiln NOT monitored by CEMS. (Note: Per 98.87, you must retain records of results from kiln level calculations (such as results from Equation H-2, H-3, and H-4).

CO₂ process emissions for all kilns NOT monitored by CEMS should be reported in the SUBPART H SUMMARY INFORMATION FOR THIS FACILITY table on the Subpart Overview page. Click this link for instructions on reporting [Subpart H Summary Information for this Facility](#).

CO₂ combustion emissions for all kilns NOT monitored by CEMS should be reported under Subpart C. See e-GGRT Help Content for Subpart C.

See Also

Screen Errors

[Using e-GGRT to Prepare Your Subpart H Report](#)

[Subpart H Summary Information for this Facility](#)

[Subpart H Kiln Information for Kilns NOT Monitored by CEMS](#)

[Subpart H Kiln Information for Kilns Monitored by CEMS](#)

[Subpart H Emissions Information for Kilns Monitored by CEMS](#)

[Subpart Validation Report](#)

Subpart H Emissions Information for Kilns Monitored by CEMS

This page provides step-by-step instructions on how to enter and edit Subpart H Cement Production emissions information for kilns that are monitored by a Continuous Emissions Monitoring System (CEMS).

For kilns monitored by CEMS, the emission information reported in this section may include both CO₂ process and combustion emissions from the kiln (or other combustion units if multiple units share a common stack). To avoid double-counting, you do not need to report combustion emissions in Subpart C if these emissions are already captured by the CEMS and reported here.

Step 1: Add a CEMS Monitoring Location (CML)

To add a CML, click the “Add a CEMS Monitoring Location” link below the CEMS MONITORING LOCATION (CML) SUMMARY table on the Subpart Overview page



The screenshot below is from Subpart G and is displayed as an example. The screen for other subparts may differ slightly.

Click image to expand

The screenshot displays the EPA e-GGRT interface for Subpart G reporting. The main content area is titled "Subpart G: Ammonia Manufacturing (2011) Subpart Overview". It includes an "OVERVIEW OF SUBPART REPORTING REQUIREMENTS" section, a "SUBPART G SUMMARY INFORMATION FOR THIS FACILITY" table, and two "UNIT SUMMARY" tables. The summary table shows "Annual Urea Prod. (metric tons)" as 45.0 and "Quantity of CO₂ used to produce urea (metric tons)" as 40. The unit summary tables show "No units have been added" for both categories. A "Facility Overview" link is located at the bottom of the page.

Step 2: Define a CML and report emissions information

For each CEMS Monitoring Location, provide the following information:

- A unique unit name or identifier for the CML (see also [About Unique Unit Names](#))
- An optional description or label for the CML
- The configuration of processes or process units that are monitored by the CML:
 - Single process or process unit that exhausts to a dedicated stack
 - Multiple processes or process units that share a common stack

- Process or process unit that shares a common stack with one or more stationary fuel combustion units
- The types of fuel combusted in the unit(s) monitored by the CEMS
- The Tier 4/CEMS methodology start and end dates
- The quarter total of hourly CO₂ mass emissions for each quarter of the reporting year (metric tons) (*Do not cumulate emissions data between quarters*)
- The total annual CO₂ mass emissions measured by the CEMS (metric tons)
- An indication whether emissions reported for the CEMS include emissions calculated according to 98.33(a)(4)(viii) for a slipstream that bypassed the CEMS
- The total annual biogenic CO₂ emissions from the combustion of all biomass fuels combined (metric tons) (*if not applicable, enter '0'*)
- The total annual non-biogenic CO₂ emissions which includes fossil fuel, sorbent, and process CO₂ emissions (metric tons)
- The total annual CH₄ and N₂O emissions associated with the combustion of all [Table C-2](#) fuels combusted in all processes/process units monitored by the CEMS derived from application of [Equation C-10](#) (metric tons) (*if there are no combustion emissions in this CML, please enter '0'*)
- The total number of source operating hours in the reporting year
- The total operating hours in which a substitute data value was used in the emissions calculations for the CO₂ concentration parameter
- The total operating hours in which a substitute data value was used in the emissions calculations for the stack gas flow rate parameter
- If moisture correction is required and a continuous moisture monitor is used, the total operating hours in which a substitute data value was used in the emissions calculations for the stack gas moisture content parameter
- The total annual CO₂ emissions from the CEMS Monitoring Location (CML) Summary attributable to combustion (metric tons)

Do not leave any of these fields blank. If, for example, your facility has no biogenic CO₂ emissions, enter '0'.

For assistance in calculating annual CH₄ and N₂O emissions using [Equation C-10](#), access the optional calculation spreadsheet by clicking one of the links titled "[Use Equation C-10 spreadsheet to calculate](#)" located below each of the red emissions information data entry boxes and follow the provided instructions

Step 3: Identify process units monitored at a CML

To identify the process units monitored at a CML, first click the link titled "ADD/REMOVE a process unit that exhausts to this CEMS Monitoring Location" at the bottom of the page



The screenshot below is from Subpart G and is displayed as an example. The screen for other subparts may differ slightly.

Click image to expand

Facility ABC
Subpart G: Ammonia Manufacturing (2011)
 Subpart G Overview • Add/Edit CEMS Monitoring Location

CONTINUOUS EMISSION MONITORING SYSTEM (CEMS) MONITORING LOCATION (CML) INFORMATION
 Use this page to uniquely identify each CEMS Monitoring Location (CML) Summary and provide the annual GHG emissions and other information described below. Use the "ADD/REMOVE a Process Unit" link at the bottom of the page to identify the process unit(s) monitored by this CEMS Monitoring Location (CML) Summary. For additional information about the data collected on this page, please use the e-GGRT Help link(s) provided.

CONFIGURATION
 CEMS Monitoring Location Name/ID: (40 characters maximum)
 Description (optional):
 Configuration Type: Select
 Types of fuel combusted in the unit(s) monitored by the CEMS: (200 characters maximum)

TIER 4 METHODOLOGY INFORMATION
 Calculation Methodology Start Date: 01/01/2011
 Calculation Methodology End Date: 12/31/2011

QUARTERLY CO₂ EMISSIONS
 Quarter 1: (metric tons)
 Quarter 2: (metric tons)
 Quarter 3: (metric tons)
 Quarter 4: (metric tons)

ANNUAL CO₂ EMISSIONS
 Total annual CO₂ mass emissions (biogenic and non-biogenic) measured by the CEMS: (metric tons)
 Check this box to indicate that the emissions reported for the CEMS include emissions calculated according to 40 CFR 60.131(a)(4)(viii) for a dipstream that bypassed the CEMS.
 Total annual biogenic CO₂ mass emissions: (metric tons)
 Total annual non-biogenic CO₂ mass emissions (includes fossil fuel, sorbent, and process CO₂ emissions): (metric tons)

EQUATION C-10 SUMMARY AND RESULTS

$$CH_4 \text{ or } N_2O = 0.001 * (F) * EF$$
 Hover over an element in the equation above to reveal a definition of that element.
 Enter CH₄ and N₂O emissions from only combustion of Table C-2 Fuels directly below. If there are no combustion emissions from Table C-2 Fuels in this CEMS Monitoring Location, please enter 0.
 Total CH₄ emissions: (metric tons)
 Total N₂O emissions: (metric tons)

ADDITIONAL EMISSIONS INFORMATION
 Total number of source operating hours in the reporting year: (hours)
 The total operating hours in which a substitute data value was used in the emissions calculations for CO₂ concentration: (hours)
 The total operating hours in which a substitute data value was used in the emissions calculations for stack gas flow rate: (hours)
 The total operating hours in which a substitute data value was used in the emissions calculations for stack gas moisture content (if moisture correction is required and a continuous moisture monitor is used): (hours)

CEMS MONITORING LOCATION PROCESS UNITS
 Process Unit Name/Identifier: [Dropdown]
 There are no process units monitored by CEMS available for selection.
 ADD/REMOVE/EDIT a process unit that exhausts to this CEMS Monitoring Location.
 CANCEL SAVE

On the CML Process Units Selection page, use the check boxes to select the process unit(s) monitored at this CML. This will indicate that the unit(s) selected vent emission through the stack monitored by this CML.



The screenshot below is from Subpart G and is displayed as an example. The screen for other will differ slightly depending on the number of units with emissions monitored by a single CML at your facility.

Click image to expand

SUBG 4 (2011)
Subpart G: Ammonia Manufacturing
 Subpart G Overview • Buster Ammonia • Add/Edit Process Units

IDENTIFY PROCESS UNITS(S)
 Use this page to select each process unit that is monitored by the CML. For additional information about this page, please use the e-GGRT Help link(s) provided. * denotes a required field

PROCESS UNIT: GASEOUS CEMS
 Is this process unit monitored by the CEMS Monitoring Location? (check if true)

CANCEL SAVE

Subpart Y also collects the CO₂ emissions from this CEMS Monitoring Location that are attributable to process CO₂ emissions from this process

unit (metric tons).

Click image to expand

The screenshot shows the EPA e-GGRT interface for Facility ABC (2010) Subpart Y: Petroleum Refineries. The main heading is "IDENTIFY PROCESS UNITS". Below this, there is a brief instruction: "Use this page to select each process unit that is monitored by the CEMS Monitoring Location (CML) Summary. For additional information about this page, please use the e-GGRT Help link(s) provided." A red asterisk indicates a required field. The form contains three sections, one for each process unit:

- PROCESS UNIT: CEMS1**: "Is this process unit monitored by the CEMS Monitoring Location?" (check if true). "CO₂ emissions from this CEMS Monitoring Location that are attributable to process CO₂ emissions from this process unit" (metric tons).
- PROCESS UNIT: CEMS3**: "Is this process unit monitored by the CEMS Monitoring Location?" (check if true). "CO₂ emissions from this CEMS Monitoring Location that are attributable to process CO₂ emissions from this process unit" (metric tons).
- PROCESS UNIT: CEMS2**: "Is this process unit monitored by the CEMS Monitoring Location?" (check if true).

At the bottom of the form are "CANCEL" and "SAVE" buttons. The footer includes "Paperwork Reduction Act/Burden Statement | Contact Us" and "e-GGRT RV2010 R.00 | CEMS-Add CML Unit".

When finished selecting process unit for the CML and entering additional required information (if applicable), click SAVE. You should then be directed back to the Add/Edit a CML Location form and see the units you selected listed in the CEMS MONITORING LOCATION (CML) PROCESS UNITS table.

Step 4: Save entered data for a CML

When you have finished entering data for a CML, click SAVE. You will then return to the Subpart Overview page. You will see the status of data entry for the CML updated to "Complete" in the Status column in the CEMS MONITORING LOCATION (CML) SUMMARY table.

If you don't have all the data, you can enter some now, save it, and finish later by clicking on the hyperlinked name of the CML in the CEMS MONITORING LOCATION (CML) SUMMARY table.

After you save the data on this page, the next time you open the page, the calculator on the top of the page will display the CO₂ process emissions for the CML, rounded to the nearest 0.1 of a metric ton. The value displayed is for informational purposes only.



Note: the screenshot below is from Subpart G and is displayed as an example. The screen for other subparts will differ slightly.

Click image to expand

Step 5: Repeat Steps 1-4

Repeat Steps 1-4 until emissions information has been entered for all CMLs. If you have missed something, the validation report messages will help you identify any incomplete entries.

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See Also

[Screen Errors](#)

[Using e-GGRT to Prepare Your Subpart H Report](#)

[Subpart H Summary Information for this Facility](#)

[Subpart H Kiln Information for Kilns NOT Monitored by CEMS](#)

[Subpart H Kiln Information for Kilns Monitored by CEMS](#)

[Subpart H Emissions Information for Kilns NOT Monitored by CEMS](#)

[Subpart Validation Report](#)

Using Subpart H Calculation Spreadsheets



These optional spreadsheets are provided to assist reporters in calculating emissions and in keeping records of these calculations.

Reporters are required to keep records of these calculations under 40 CFR 98.3(g) and additional subpart-specific provisions, but are not required to use these spreadsheets or to submit any spreadsheets to EPA.

Spreadsheets may include inputs to emission equations, reporting of which EPA deferred, some until 2013 and others until 2015.

(See 76 FR 53057, published August 25, 2011, <http://www.gpo.gov/fdsys/pkg/FR-2011-08-25/pdf/2011-21727.pdf>).

Overview

This help page provides guidance for working with the supplemental Subpart H calculation spreadsheets. The guidance provides step-by-step instructions for the following tasks:

- Understanding the Flow of Subpart H Calculation Spreadsheets
- Downloading a Calculation Spreadsheet
- General Information on Using a Calculation Spreadsheet
- Using the Equation H-1 Calculation Spreadsheet
- Using the Equation H-2, H-3, H-4 Calculation Spreadsheet
- Using the Equation H-5 Calculation Spreadsheet

Specific information on each of the spreadsheet tools is provided below:

Calculation Spreadsheet (click to download)	Unit Level	Calculation Result	Instructions (click to view)
Equation H-1 Calculation Spreadsheet.xls	All kilns	Total CO ₂ from Cement Production	H-1 Help
Equation H-2, H-3, H-4 Calculation Spreadsheet.xls	Single kiln	CO ₂ from Clinker Production	H-2, H-3, H-4 Help
Equation H-5 Calculation Spreadsheet.xls	Single kiln	CO ₂ from Raw Materials	H-5 Help

Understanding the Flow of Subpart H Calculation Spreadsheets

Subpart H requires a facility to report annual CO₂ process emissions from cement production for all kilns. To calculate these emissions, users must use the five equations displayed below:

(Equation H-1)	$CO_{2CMF} = \sum_{m=1}^k CO_{2Cli,m} + CO_{2rm}$
(Equation H-2)	$CO_{2 Cli,m} = \sum_{j=1}^p \left[(Cli_{,j}) * (EF_{Cli,j}) * \frac{2000}{2205} \right] + \sum_{i=1}^r \left[(CKD_{,i}) * (EF_{CKD,i}) * \frac{2000}{2205} \right]$
(Equation H-3)	$EF_{Cli} = (Cli_{CaO} - Cli_{ncCaO}) * MR_{CaO} + (Cli_{MgO} - Cli_{ncMgO}) * MR_{MgO}$

(Equation H-4)	$EF_{CKD} = (CKD_{CaO} - CKD_{ncCaO}) * MR_{CaO} + (CKD_{MgO} - CKD_{ncMgO}) * MR_{MgO}$
(Equation H-5)	$CO_{2,rm} = \sum_{i=1}^m rm * TOCr_m * \frac{44}{12} * \frac{2000}{2205}$

Equations H-2, H-3, H-4, and H-5 calculate results for a kiln that are subsequently used in Equation H-1. Three different calculation spreadsheets must be used to calculate the total annual CO₂ process emissions from cement production for all kilns (Equations H-2, H-3, and H-4 are grouped into a single calculation spreadsheet). Users should first complete calculations using Equation H-2, H-3, H-4 Calculation Spreadsheet and Equation H-5 Calculation Spreadsheet for each kiln and then enter the results for each kiln into the Equation H-1 Calculation Spreadsheet to calculate the total annual CO₂ process emissions from cement production for all kilns.

Downloading a Calculation Spreadsheet

Calculation spreadsheets for Subpart H may be downloaded by clicking one of the links in the first column of the table below. Users may also jump to instructions for each calculation spreadsheet by clicking one of the links in the third column.

Calculation Spreadsheet (click to download)	Unit Level	Calculation Result	Instructions (click to view)
Equation H-1 Calculation Spreadsheet.xls	All kilns	Total CO ₂ from Cement Production	H-1 Help
Equation H-2, H-3, H-4 Calculation Spreadsheet.xls	Single kiln	CO ₂ from Clinker Production	H-2, H-3, H-4 Help
Equation H-5 Calculation Spreadsheet.xls	Single kiln	CO ₂ from Raw Materials	H-5 Help

Using a Spreadsheet to Make Calculations

The guidance provided in this section applies to each of the calculation spreadsheets for Subpart H. Additional guidance is provided for each individual calculation worksheet in the sections below.

Color coding

The calculation spreadsheets contain green input cells, gray informational cells, and red-bordered results cells filled with yellow or white. Users should use green input cells to enter all data specific to their facility, unit, or process. Gray informational cells contain parameter names, column and row headings, equation constants and subtotals. Calculation results are displayed in red-bordered results cells filled with yellow or white. For red-bordered, yellow-filled results cells, the values in these cells should be entered in the appropriate and separate calculation spreadsheet (as directed below cell) where additional calculations will be made. For red-bordered, white filled results cells, the values in these cells should be entered in e-GGRT for the appropriate process units. All cells that are not green input cells are locked and cannot be modified.

	Green input cell (data entry)
	Gray informational cells (locked)
	Red-bordered, yellow-filled results cells (enter in appropriate and separate calculation spreadsheet)
	Red-bordered, white filled results cells (enter in e-GGRT)

Stop and Warning Messages

The calculation spreadsheets will display a stop message if the user enters a value that is invalid or a warning message if the user enters a value outside the EPA estimated range for a particular data element. For invalid data entries, the stop messages will not allow a user to proceed and the user must reenter valid data before moving forward. For data entries that are outside the EPA estimated range for a particular data element, the warning messages will allow a user to proceed if the user deems the entered value to be accurate.

Multiple Kilns

Users with multiple kilns should use separate calculation spreadsheets for each kiln. Users should not aggregate data from multiple kilns until requested to do so in the Equation H-1 Calculation Spreadsheet.

Using the Equation H-1 Calculation Spreadsheet

Use this spreadsheet to calculate total annual CO₂ process emissions from all kilns used in cement production. Calculated results from the Equation H-2, H-3, H-4 Calculation Spreadsheet and the Equation H-5 Calculation Spreadsheet are required as inputs to the Equation H-1 Calculation Spreadsheet. Be sure to complete the Equation H-2, H-3, H-4 Calculation Spreadsheet and the Equation H-5 Calculation Spreadsheet before beginning work on the Equation H-1 Calculation Spreadsheet. Equation H-1 is provided below.

(Equation H-1)

$$CO_{2CMF} = \sum_{m=1}^k CO_{2Cli,m} + CO_{2rm}$$

Begin by entering the facility name, your name, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Reporting Period:	
Comments:	
Unit Type:	Cement kiln

Next, enter the requested information from the Equation H-2, H-3, H-4 Calculation Spreadsheet and the Equation H-5 Calculation Spreadsheet in the green input cells of the Input Data table.

Input Data

Enter results from Equation H-2 for each kiln. Space for up to 10 kilns is provided. Use additional copies of this spreadsheet for additional kilns.

Kiln Number	[CO _{2cli,m}] = Total annual emissions of CO ₂ from clinker production from kiln m, metric tons
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
	[CO _{2cli,m}] is calculated from Equation H-2

Enter result from Equation H-5.

[CO _{2rm}] = Total annual emissions of CO ₂ from raw materials, metric tons		[CO _{2rm}] is calculated from Equation H-5
--	--	--

The H-1 calculation spreadsheet will calculate the total annual CO₂ process emissions from cement production for all kilns. The calculated value will be displayed in a red-bordered cell with white fill at the bottom of the spreadsheet. This value should be entered in e-GGRT for this facility.

Annual CO₂ process emissions from all kilns at the facility (metric tons), result from Equation H-1

[CO ₂ _{CMF}] = Annual process emissions of CO ₂ from cement manufacturing, metric tons	
--	--

Enter this value in e-GGRT

Using the Equation H-2, H-3, H-4 Calculation Spreadsheet

Use this spreadsheet to calculate the annual CO₂ emissions from clinker production for each kiln by first using Equations H-3 and H-4 to calculate emission factors which are then used in Equation H-2 to calculate emissions. Equations H-2, H-3, and H-4 are provided below.

(Equation H-2)	$CO_2 \text{ cli},m = \sum_{j=1}^p \left[(Cli_{j}) * (EF_{cli,j}) * \frac{2000}{2205} \right] + \sum_{i=1}^r \left[(CKD_{i}) * (EF_{CKD,i}) * \frac{2000}{2205} \right]$
(Equation H-3)	$EF_{cli} = (CLi_{CaO} - Cli_{ncCaO}) * MR_{CaO} + (Cli_{MgO} - Cli_{ncMgO}) * MR_{MgO}$
(Equation H-4)	$EF_{CKD} = (CKD_{CaO} - CKD_{ncCaO}) * MR_{CaO} + (CKD_{MgO} - CKD_{ncMgO}) * MR_{MgO}$

Begin by entering the facility name, your name, the unit (e.g. kiln) name or identifier, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Unit Name/ ID:	
Reporting Period:	
Comments:	
Unit Type:	Cement kiln

Next, enter the requested information in the green input cells in the Input Data table for a given unit or kiln.

Input Data

Month	[Cl _{i,ca}] = Quantity of clinker produced in month j from kiln m, tons	[Cl _{cao}] = Monthly total CaO content of Clinker, wt-fraction	[Cl _{ccao}] = Monthly non-calced CaO content of Clinker, wt-fraction	[Cl _{mgO}] = Monthly total MgO content of Clinker, wt-fraction	[Cl _{ccmgO}] = Monthly non-calced MgO content of Clinker, wt-fraction
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					

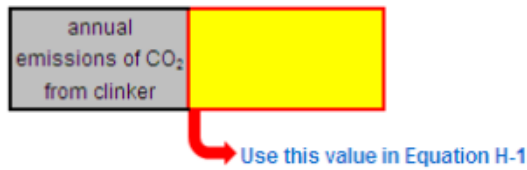
Difference, [Cl _{cao}] - [Cl _{ccao}]. If result is less than zero (i.e., non-calced CaO content is greater than the calced CaO content), then zero is used in the calculation.	Difference, [Cl _{mgO}] - [Cl _{ccmgO}]. If result is less than zero (i.e., non-calced MgO content is greater than the calced MgO content), then zero is used in the calculation.
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0

Quarter	[CKD _i] = Cement kiln dust (CKD) not recycled to the kiln in quarter i from kiln m, tons	[CKD _{cao}] = Quarterly total CaO content of CKD not recycled to the kiln, wt-fraction	[CKD _{ccao}] = Quarterly non-calced CaO content of CKD not recycled to the kiln, wt-fraction	[CKD _{mgO}] = Quarterly total MgO content of CKD not recycled to the kiln, wt-fraction	[CKD _{ccmgO}] = Quarterly non-calced MgO content of CKD not recycled to the kiln, wt-fraction
First					
Second					
Third					
Fourth					

Difference, [CKD _{cao}] - [CKD _{ccao}]. If result is less than zero (i.e., non-calced CaO content is greater than the calced CaO content), then zero is used in the calculation.	Difference, [CKD _{mgO}] - [CKD _{ccmgO}]. If result is less than zero (i.e., non-calced MgO content is greater than the calced MgO content), then zero is used in the calculation.
0.0	0.0
0.0	0.0
0.0	0.0
0.0	0.0

The spreadsheet will calculate the annual CO₂ process emissions from clinker production for a single kiln. The calculated value will be displayed in a red-bordered cell with yellow fill at the bottom of the spreadsheet. This value should be entered into the Equation H-1 Calculation Spreadsheet.

Annual CO₂ Emissions from clinker production (metric tons), result from Equation H-2



Using the Equation H-5 Calculation Spreadsheet

Use this spreadsheet to calculate the total annual CO₂ emissions from raw materials used in cement production. Equation H-5 is provided below.

(Equation H-5)

$$CO_{2,rm} = \sum_{i=1}^m rm * TOCr_{m} * \frac{44}{12} * \frac{2000}{2205}$$

Begin by entering the facility name, your name, the reporting period, and any additional comments in the green input cells of the general information table located immediately below the equation in the calculation spreadsheet. This is for your records.

Facility Name:	
Reporter Name:	
Reporting Period:	
Comments:	
Unit Type:	Cement kiln

Next, enter the requested information in the green input cells of the Input Data table for a kiln.

Input Data

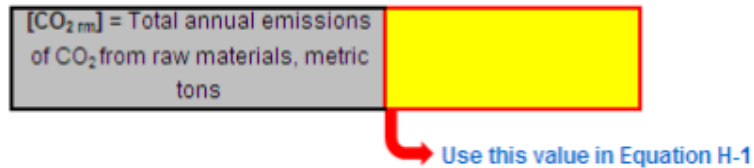
Space for up to 30 materials is provided. Use additional copies of this spreadsheet for additional material

Raw material	[rm] = The amount of raw material i consumed annually, tons/yr (dry basis) or the amount of raw kiln feed consumed annually, tons/yr (dry basis)	[TOCr _m] = Organic carbon content of raw material i or organic carbon content of combined raw kiln feed (dry basis), as determined in §98.84(c) or using a default factor of 0.2 percent of total raw material weight, weight fraction
1		0.002
2		0.002
3		0.002
4		0.002
5		0.002
6		0.002
7		0.002
8		0.002
9		0.002
10		0.002
11		0.002
12		0.002
13		0.002
14		0.002
15		0.002
16		0.002
17		0.002
18		0.002
19		0.002
20		0.002
21		0.002
22		0.002
23		0.002
24		0.002
25		0.002
26		0.002
27		0.002
28		0.002
29		0.002
30		0.002

The default value for TOCr_m is 0.002

The spreadsheet will calculate the annual CO₂ emissions from raw materials used in cement production. The calculated value will be displayed in a red-bordered cell with yellow fill at the bottom of the spreadsheet. This value should be entered into the Equation H-1 Calculation Spreadsheet.

Annual CO₂ Emissions from clinker production (metric tons), result from Equation H-5



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